# REMARKS

Claims 1, 2 and 4-6 are pending. Claims 1, 5, and 6 have been amended. No new matter has been introduced. Reexamination and reconsideration of the application are respectfully requested.

In the Office Action dated September 27, 2007, the Examiner rejected claims 1,2 and 4-6 under 35 U.S.C. § 103(a) as being unpatentable over Kenmochi et al., European Patent Application 1220195, (hereinafter Kenmochi) in view of Gibson et al., U.S. Patent No. 6,336,092 (hereinafter Gibson). Applicant respectfully traverses the rejections in view of the claims, as amended.

**Independent claim 1, as amended, recites:**

A singing voice synthesizing apparatus, comprising:
a singing voice information input device that inputs singing voice information for synthesizing a singing voice;
a phoneme database that stores voice synthesis unit data;
a selector that selects the voice synthesis unit data stored in the phoneme database in accordance with the singing voice information;
a timbre transformation parameter input device that inputs a timbre transformation parameter for transforming timbre, the timbre transformation parameter including a coefficient $\alpha$ indicating whether a singing voice is made to be feminine or masculine;
*a mapping function generator that generates, in accordance with the coefficient included in the timbre transformation parameter, a mapping function defined by a following equation (1)*

$$fout = (fs/2) \times (2 \times fin /fs)^{\alpha} \quad (1),$$

where fout is an output frequency, fs is a sampling frequency, fin is an input frequency, and $\alpha$ is the coefficient indicating whether the singing voice is made to be feminine or masculine; and
*a singing voice synthesizer that generates a spectrum envelope based on the selected voice synthesis unit data, transforms the generated spectrum envelope in accordance with the mapping function generated by using a local peak frequency of the spectrum envelope as the input frequency, and generates a synthetic singing voice of which character is changed by using the transformed spectrum envelope.*

The Kenmochi reference does not disclose, teach, or suggest the apparatus recited in independent claim 1, as amended. Unlike the apparatus specified in independent claim 1, as

amended, Kenmochi does not teach a singing voice synthesizing apparatus which includes "*a singing voice synthesizer that generates a spectrum envelope based on the selected voice synthesis unit data, transforms the generated spectrum envelope in accordance with the mapping function generated by using a local peak frequency of the spectrum envelope as the input frequency, and generates a synthetic singing voice of which character is changed by using the transformed spectrum envelope*" wherein the mapping function is defined by the equation "*fout = (fs/2) x (2 x fin /fs)$^{\alpha}$ .*"

Kenmochi discloses an apparatus which includes a phoneme database comprised of individual phonemes and phoneme chains obtained by dividing into segments of SMS data of deterministic and stochastic components obtained from an SMS analysis of input voices. A phoneme-to-fragment conversion means 21 generates a fragment string from a phoneme string that has been converted based on input lyrics, and selectively reads out voice fragments from the phoneme database 10. *(Kenmochi, Abstract and paragraphs 0059-0063)* However, Kenmochi fails to disclose, teach, or suggest "*a singing voice synthesizer that generates a spectrum envelope based on the selected voice synthesis unit data, transforms the generated spectrum envelope in accordance with the mapping function generated by using a local peak frequency of the spectrum envelope as the input frequency, and generates a synthetic singing voice of which character is changed by using the transformed spectrum envelope*" wherein the mapping function is defined by the equation "*fout = (fs/2) x (2 x fin /fs)$^{\alpha}$ .*"

The Gibson reference does not make up for the deficiencies of Kenmochi. The Gibson reference discloses various methods used to modify the shape of a spectral envelope in a voice conversion. *(Gibson, Col. 7, line 18 – Col. 8, line 62)* However, the combination of Kenmochi and Gibson fails to disclose, teach, or suggest an apparatus which includes"*a singing voice*

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*synthesizer that generates a spectrum envelope based on the selected voice synthesis unit data, transforms the generated spectrum envelope in accordance with the mapping function generated by using a local peak frequency of the spectrum envelope as the input frequency, and generates a synthetic singing voice of which character is changed by using the transformed spectrum envelope*" wherein the mapping function is defined by the equation "*fout = (fs/2) x (2 x fin /fs)$^{\alpha}$*." Accordingly, Applicant respectfully submits that independent claim 1, as amended, distinguishes over Kenmochi in combination with Gibson.

Independent claims 5 and 6, as amended, recite limitations similar to those in independent claim 1, as amended. Accordingly, Applicant respectfully submits that independent claims 5 and 6, as amended, distinguish over Kenmochi in combination with Gibson for reasons similar to those set forth above with respect to independent claim 1, as amended.

Claims 2 and 4 depend from independent claim 1, as amended. Accordingly, Applicant respectfully submits that claims 2 and 4 distinguish over Kenmochi in combination with Gibson for the same reasons set forth above with respect to independent claim 1, as amended.

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Applicant believes that the claims are in condition for allowance. If, for any reason, the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 488-7100 to discuss the steps necessary for placing the application in condition for allowance.

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